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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,024	09/30/2003	Alan R. Arthur	200311580-1	9379

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FORT COLLINS, CO 80527-2400

EXAMINER
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CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/677,024

Applicant(s)

ARTHUR ET AL.

Examiner

Tony Chuo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/30/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 9/30/03 was filed on 9/30/03. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Drawings***

2. The drawings filed on 9/30/03 are accepted by the examiner.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 1-31 and 46-47 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The disclosure fails to state or teach one of ordinary skill in the art how to define an axis of volumetric expansion, project a sphere with a center on the axis, and define a center of growth of each of the components. It is unclear how the axis of volumetric expansion was determined to be in a single vertical direction as shown in figure 1. A component can expand and contract in multiple directions. It is also unclear

Art Unit: 1745

how to project a sphere with a center on the axis since the diameter of the sphere is unknown and the location of the interface will vary depending upon the size of the sphere. The exemplary structure shown in figure 1 illustrates a sphere projected on a cylindrical component. However, the size of the sphere could not be determined if the component was not cylindrical. It is also unclear how the interface surface is defined with reference to a center of growth. The interface surface "110" is unclear because it is shown in figure 1 as a line inside the cylindrical component "100". Thus, the specification fails to teach one skilled in the art how to form the claimed interface without resorting to undue experimentation to determine the axis of volumetric expansion and the center of growth. Due to the large quantity of experimentation necessary to determine the axis of volumetric expansion and the center of growth such that it can be determined how to form the claimed interface, the insufficient guidance presented in the specification regarding the same, the complex nature of the invention, and the relative skill of those in the art, the specification fails to teach the skilled artisan how to make and use the claimed invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 46 and 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how a shear plane is formed with reference to a center of growth that is indefinite.

***Claim Rejections - 35 USC § 102/103***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 32-44 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Prediger et al (US 2002/0142204). Regarding claims 32-40, The Prediger reference teaches a solid oxide fuel cell system "10" comprising a current collector plate "14" in contact with a ceramic electrolyte membrane "18" to form an interface between two components that have different rates of volumetric expansion (See paragraph [0028]). Regarding claim 41, the current collector plate is construed as an electrical pass through assembly because current is passing through the plate (See paragraph [0028]). Regarding claim 42, it also teaches a frame seal "20" surrounding the ceramic electrolyte "18" that is a ceramic retention feature assembly (See paragraph [0028]). Regarding claim 43, it also teaches seals "38" that are located on the fuel cells at the end of the fuel cell stack "100" (See paragraph [0029]). Regarding claim 44, the frame seal "20" also provides a sealing

Art Unit: 1745

means between the current collector plate and the ceramic electrolyte (See paragraph [0028]).

Examiner's note: It is noted that the instant claims are being construed as product-by-process claims and that the product itself does not depend on the process of making it. Accordingly, in a product-by-process claim, the patentability of a product does not depend on its method of production. It is further noted that the method of forming the interface is not given patentable weight because the method claims lack enablement.

Therefore, the claims are anticipated by Prediger et al. However, if the claims are not anticipated, the claims are obvious as it has been held similar product claimed in product-by-process limitations are obvious (*In re Brown* 173 USPQ 685 and *In re Fessman* 180 USPQ 324 (Refer to MPEP 2113: Product-by-Process Claims)).

10. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prediger et al (US 2002/0142204) in view of Anderson et al (US 5799951). The Prediger reference is applied to claims 32-44 for reasons stated above. However, the reference does not disclose a liquid metal seal. The Anderson reference teaches the use of liquid metal seals which utilize the phenomena of surface tension to improve seal between a rotating shaft and its housing (See column 1, lines 23-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Prediger fuel cell to include a liquid metal seal in order to utilize a material that is capable of forming a reliable seal that allows slippage between two components.

Examiner's note: The Anderson reference is pertinent to the Prediger reference and the

Art Unit: 1745

applicant's field of endeavor because it solves the same problem of forming a reliable seal that allows slippage between two components.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

  
SUSY TSANG-FOSTER  
PRIMARY EXAMINER